

MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

The MONTHLY WEATHER REVIEW for August, 1900, is based on reports from about 3,097 stations furnished by employees and voluntary observers, classified as follows: regular stations of the Weather Bureau, 158; West Indian service stations, 12; special river stations, 132; special rainfall stations, 48; voluntary observers of the Weather Bureau, 2,562; Army post hospital reports, 18; United States Life-Saving Service, 9; Southern Pacific Railway Company, 96; Canadian Meteorological Service, 32; Mexican Telegraph Service, 20; Mexican voluntary stations, 7; Mexican Telegraph Company, 3. International simultaneous observations are received from a few stations and used, together with trustworthy newspaper extracts and special reports.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Mr. Curtis J. Lyons, Meteorologist to the Hawaiian Government Survey, Honolulu; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Mr. Maxwell Hall, Government Meteorologist, Kingston, Jamaica; Capt. S. I. Kimball, Superintendent of the United States Life-Saving Service;

and Commander Chapman C. Todd, Hydrographer, United States Navy.

The REVIEW is prepared under the general editorial supervision of Prof. Cleveland Abbe. The current number has been put through the press by Prof. Alfred J. Henry, the Editor being absent from the city.

Attention is called to the fact that the clocks and self-registers at regular Weather Bureau stations are all set to seventy-fifth meridian or eastern standard time, which is exactly five hours behind Greenwich time; as far as practicable, only this standard of time is used in the text of the REVIEW, since all Weather Bureau observations are required to be taken and recorded by it. The standards used by the public in the United States and Canada and by the voluntary observers are believed to conform generally to the modern international system of standard meridians, one hour apart, beginning with Greenwich. The Hawaiian standard meridian is $157^{\circ} 30'$ or $10^{\text{h}} 30^{\text{m}}$ west of Greenwich. Records of miscellaneous phenomena that are reported occasionally in other standards of time by voluntary observers or newspaper correspondents are sometimes corrected to agree with the eastern standard; otherwise, the local standard is mentioned.

FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

The general atmospheric conditions which attend periods of abnormal heat over the northeastern quarter of the United States prevailed from early in July to the second decade of September, 1900. These conditions are recognized in the distribution of air pressure, as indicated by the barometer, and by a lack of strength and activity on the part of areas of low barometer.

During ten weeks of the summer of 1900 the barometer was persistently high over the Southeastern States and low in the Northwest, and the eastern half of the country was not visited by general storms.

The effect of these prevailing conditions was a stagnation of air over the Northeastern States; and a result of this stagnated condition was that air near the surface of the earth became superheated, since the intensity of the sun's rays was broken neither by extensive cloud areas nor by the presence in the air of any considerable amount of moisture.

Considered as a whole, the month of August, 1900, was the warmest August on record generally from the upper Mississippi Valley over the Lake region, Ohio Valley, and Middle Atlantic States. This high record was accomplished not by individual maximum temperatures which exceeded those previously noted, but by the number of successive days on which the temperature ranged in the nineties. Thus, at Washington, D. C., there were fourteen consecutive days with a maximum temperature of 90° or above, while during the

seven-day period—August 6 to 12, inclusive—the daily maximum temperatures did not fall below 96° , and an extreme maximum of 101° was reached. This was the warmest seven-day period ever experienced in Washington, and the records for groups of days at various points were similarly broken throughout the heated area.

The Weather Bureau, in its regular detailed twice-daily forecasts and in special bulletins issued from time to time, announced indicated continuations of high temperature several days in advance, and also temporary breaks in the heat, due to the development of local storms or the passage of weak general disturbances. Finally, on September 12, a special bulletin was issued which definitely announced that the heated period would be permanently broken within the next twenty-four hours. The evidence which furnished a base for this forecast proved trustworthy, and the great mass of heated air which had been practically undisturbed for more than two months was effectually broken up and dispersed by the passage over the Great Lakes and the St. Lawrence Valley of the storm which devastated Galveston, Tex., on September 8. Detailed records of high temperatures registered throughout the heated area are presented under the heading The Hot Weather of August, 1900, in another part of this REVIEW.

No storm warnings were required for the Atlantic and Pacific coasts, the Lake region, and the West Indies during

August, 1900, and special forecasts or warnings other than those relating to the heat were not issued.

AREAS OF HIGH AND LOW PRESSURE.

During the month there were six highs and eight lows which could be charted. (See Charts I and II.) A brief description of their more prominent characteristics is given herewith:

Highs.—All of the highs originated north of the forty-fifth parallel, and three of them, Nos. I, II, and IV, as far east as the eighty-fifth meridian. Nos. I, III, and VI disappeared off the middle Atlantic coast; Nos. II and IV beyond the St. Lawrence Valley, and No. V north of Lake Superior. No. II moved very slowly after reaching the sixtieth meridian, consuming four days in covering a distance of a few hundred miles.

Movements of centers of areas of high and low pressure.

| Number. | First observed. | | | Last observed. | | | Path. | | Average velocities. | |
|----------------------|-----------------|---------|----------|----------------|---------|----------|---------------|--------------|---------------------|---------------|
| | Date. | Lat. N. | Long. W. | Date. | Lat. N. | Long. W. | Length. | Duration. | Daily. | Hourly. |
| High areas. | | | | | | | <i>Miles.</i> | <i>Days.</i> | <i>Miles.</i> | <i>Miles.</i> |
| I..... | 2, p. m. | 48 | 87 | 4, p. m. | 39 | 75 | 1,100 | 2.0 | 550 | 22.9 |
| II..... | 11, a. m. | 48 | 88 | 17, a. m. | 48 | 54 | 1,425 | 2.5 | 570 | 23.7 |
| III..... | 15, a. m. | 50 | 108 | 18, a. m. | 48 | 75 | 1,780 | 3.0 | 593 | 24.7 |
| IV..... | 18, a. m. | 48 | 86 | 20, a. m. | 49 | 69 | 900 | 2.0 | 450 | 18.8 |
| V..... | 19, a. m. | 51 | 114 | 22, a. m. | 48 | 85 | 1,400 | 2.5 | 560 | 23.3 |
| VI..... | 26, a. m. | 51 | 120 | 2, a. m.* | 41 | 70 | 8,110 | 7.0 | 444 | 18.5 |
| Sums..... | | | | | | | 9,715 | 19.0 | 3,167 | 131.9 |
| Mean of 6 paths..... | | | | | | | 1,619 | | 528 | 22.0 |
| Mean of 19 days..... | | | | | | | | | 511 | 21.3 |
| Low areas. | | | | | | | | | | |
| I..... | 8, a. m. | 46 | 78 | 9, p. m. | 46 | 60 | 900 | 1.5 | 600 | 25.0 |
| II..... | 8, p. m. | 51 | 120 | 11, p. m. | 46 | 60 | 2,925 | 3.0 | 975 | 40.6 |
| III..... | 11, p. m. | 54 | 114 | 14, a. m. | 48 | 85 | 1,405 | 2.5 | 532 | 23.4 |
| IV..... | 11, p. m. | 38 | 100 | 14, a. m. | 41 | 74 | 1,575 | 2.5 | 630 | 26.2 |
| V..... | 18, a. m. | 38 | 100 | 16, a. m. | 48 | 68 | 2,175 | 3.0 | 725 | 30.2 |
| VI..... | 19, p. m. | 43 | 100 | 21, p. m. | 35 | 75 | 1,650 | 2.0 | 825 | 34.4 |
| VII..... | 20, a. m. | 45 | 64 | 22, a. m. | 48 | 54 | 600 | 2.0 | 300 | 12.5 |
| VIII..... | 20, p. m. | 51 | 114 | 25, a. m. | 48 | 89 | 1,850 | 4.5 | 411 | 17.1 |
| | 23, a. m. | 51 | 114 | | | | 1,150 | 2.0 | 575 | 24.0 |
| Sums..... | | | | | | | 14,230 | 23.0 | 5,603 | 233.4 |
| Mean of 9 paths..... | | | | | | | 1,581 | | 623 | 26.0 |
| Mean of 23 days..... | | | | | | | | | 619 | 25.8 |

*September.

After the morning of the 5th the high charted as No. I settled down over the Southern States, and also overspread the Ohio Valley. This high, in combination with the northwestern low, caused an extensive warm wave to set in on the 6th over the entire country east of the Rocky Mountains, and it continued almost without interruption during the remainder of the month over the major portion of this great territory. Over many districts this warm wave had never

been equaled for duration and intensity. The high on the Pacific coast persisted until the evening of the 9th with varying intensity, and frequently thereafter, particularly on the north coast.

Lows.—The lows also kept well to the northward in their passage over the country. But one, No. IV, originated south of the fortieth parallel, and but one, No. VI, moved south of that line; both originated in the middle slope. Nos. II, III, V, and VIII originated in the British Northwest Territory west of the one-hundred and tenth meridian. No. II moved almost due eastward, passing into the Atlantic Ocean by way of Cape Breton Island. No. V pursued a very similar course, although somewhat more to the northward. No. III was an offshoot from the depression which persisted during almost the entire month over the Northwest; it moved eastward and was lost to the northeastward of Lake Superior. No. VI was also an offshoot from this depression. No. VIII, in reality, consisted of two separate depressions which originated near to each other in western Alberta, and, after pursuing different paths, converged into one northwest of Lake Superior, and then moved off to the northeastward. No. VII came up from the south Atlantic Ocean. Its first land appearance was on the Nova Scotia coast, whence it moved northeastward, passing out into the ocean by way of St. Johns, N. F.—*H. C. Frankenfield, Forecast Official.*

RIVERS AND FLOODS.

With the advent of the low water season the rivers, with the exception of the upper Mississippi, fell generally throughout the whole country. When compared with the month of August, 1899, it is noticed that this year's stages of the Mississippi River proper were a foot or more higher than last year's, as were also those of the tributary streams to the eastward. The western tributaries were, as a rule, somewhat higher in 1899. The rivers of the Atlantic and Gulf systems were also higher in 1900 than in 1899, while over the Pacific system the reverse was true, but not to a marked degree.

No high stages occurred.

During the month the new Brazos River service in Texas was commenced with two stations in operation, viz, Kopperl and Waco, Tex. Other stations will be added in a short time, and it is believed that in time of future floods this service will, by the issue of timely warnings, prove the means of preserving many lives and much valuable property. The headquarters of this service are at Galveston, Tex.

The highest and lowest water, mean stage, and monthly range at 129 river stations are given in Table XI. Hydrographs for typical points on seven principal rivers are shown on Chart V. The stations selected for charting are: Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—*H. C. Frankenfield, Forecast Official.*

CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following extracts relating to the general weather conditions in the several States and Territories are taken from the monthly reports of the respective sections of the Climate and Crop Service. The name of the section director is given after each summary.

Rainfall is expressed in inches and temperature in degrees Fahrenheit.

Alabama.—The mean temperature was 81.6°, or 2.2° above normal; the highest was 105°, at Goodwater on the 11th, and the lowest, 62°, at Riverton and Valleyhead on the 1st, at Newton on the 8th, and at Pineapple on the 26th. The average precipitation was 2.89, or 1.74 below normal; the greatest monthly amount, 9.85, occurred at Citronelle, and the least, 0.50, at Pineapple.—*F. P. Chaffee.*

Arizona.—The mean temperature was 80.3°, or 3.7° below normal; the highest was 119°, at Parker on the 1st, and the lowest, 30°, at Strawberry on the 30th. The average precipitation was 1.02, or 1.10 below